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Studies of Highly Qualified Manpower
in the Canadian Department of Manpower
and Immigration

by

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This paper outlines the programme of research in Highly Qualified Manpower which is being carried out by the Department of Manpower and Immigration in Ottawa and describes the Survey of Highly Qualified Manpower which has been designed to provide some of the data required for the conduct of these studies.

The Department of Manpower and Immigration was formed in 1966 in order to help to develop the Canadian labour force and to bring about a better allocation and utilisation of human resources in Canada. With the object of helping to improve both individual and national productivity, the education and skill level of the Canadian labour force and its effective utilisation is being raised by selective immigration, and by helping those in employment to find better jobs.

The Department was formed by combining the manpower activities which had previously been carried out in other Departments. They were the former National Employment Service, which for most of its existence had formed part of the Unemployment Insurance Commission; the Immigration activities of the Department of Citizenship and Immigration; and the Research, Vocational Training and Rehabilitation Branches of the Department of Labour. In the new Department of Manpower and Immigration these services were reorganised with the object of providing a range of counselling services to potential immigrants and to the community within Canada. Whereas the activities of the former National Employment Service had tended to be focussed upon the unemployed and other marginal

groups in the labour force, the new services of the Department of Manpower and Immigration have been extended and given a change of direction: they are available to the whole of the labour force and also to people outside the labour force. These counselling services are carried out through the instrument of the placement activity of the Department in its 219 Canada Manpower Centres which are distributed across the country. The centres provide better information to both sides of the labour market about employment opportunities and the availability of manpower and, where necessary, provide employees with access to training, rehabilitation or relocation facilities.

In the case of highly qualified manpower the task of helping to achieve a better allocation and utilisation has to be approached more indirectly than for other types of manpower. While some counselling is provided by the Department directly to university graduates about to enter the labour market and while the facilities of the Canada Manpower Centres are available to everyone, the development, allocation and use of highly qualified manpower are also the concern of many other institutions and of individuals. Decisions about highly qualified manpower are also made by the professional associations, other government departments both federal and provincial, the universities, the colleges of technology, the schools, guidance counsellors in the schools, employers, qualified people already in the labour market, and students preparing to enter the market and their parents. Furthermore, their decisions are frequently long-range ones; and the information required for their decisions about the production and use of highly qualified manpower is to a large extent about long-term opportunities, requirements, plans and resources which they are not all well able to provide for themselves.

The reasons for conducting special studies of highly qualified manpower are, first, that it is a relatively important segment of the labour force which makes a proportionately large contribution to the GNP, and which is increasing rapidly as a proportion of the labour force. It has risen from about 8% of the labour force in 1946 to about 17% ⁽¹⁾ of the labour force in 1967, and it is clear

from the expressed intentions of students in school and from the nature of the expansion of the Canadian educational system that the numbers of people in highly qualified occupations will continue to increase rapidly. These trends will continue to be encouraged by Canada's selective ⁽²⁾ immigration policy which is becoming increasingly geared to recruiting abroad manpower for those occupations in which the scarcity of manpower is relatively greater.

Secondly, it is evident that highly qualified manpower performs a special role in economic growth, even though the nature and process of its contribution are not fully understood. Highly qualified manpower, in addition to being a relatively more valuable economic resource, also performs the role of improving the economic value of all human resources. Health manpower, for example, carries out this role by increasing the length of active working lives and by reducing absence from employment due to sickness and disability; and manpower in the education industry by increasing human capital resources. At present the Department of Manpower and Immigration is primarily concerned with scientists and engineers which number roughly 100,000 people since they perform a direct role in the generation of economic growth in a modern technological society by their activities in discovering knowledge and adapting it for productive purposes. In addition, highly qualified manpower contributes directly to the management of the economy, and particularly to the management of technology. It is responsible to a large extent for the management of all other kinds of manpower. Furthermore, the specific economic demands for many other levels of manpower, notably those in the technician and technologist levels, are often directly linked to the use of the most highly qualified members of the labour force.

(1) Highly qualified manpower is taken to be people in professional, scientific and higher management occupations. At present it cannot be estimated with precision since the Census does not distinguish working proprietors from other kinds of managers; but taking half the number of managers reported in the Census to be in the highly qualified category there was 1.25 million highly qualified manpower in Canada in 1961.

(2) The policy is selective in that preference is given to applicants with high levels of education and skill. In all other respects the policy is universal and non-discriminatory.

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In Canada, highly qualified manpower is of extreme importance because of the role played by immigrants in contributing to gross population growth, and to the social structure of the community. Because adult immigrants already embody the product of investment in education in other countries and are nearer to their child-bearing years, they contribute quickly to population, to production and to the creation of services, notably the growth of the Canadian educational system, thus generating a relatively quick economic return, quite apart from the effects which their expenditure has in generating additional outputs throughout the economy.

Thirdly, highly qualified manpower merits special attention because it is a relatively more valuable economic resource. Given the relatively greater investment in its education, the social and economic benefits of this kind of manpower being well allocated are greater than for other types. Since the gestation period in the creation of this type of manpower is longer, it is often relatively scarce; and because it is highly mobile in all ways the scarcity in any particular occupation or occupational speciality is capable of becoming serious more quickly than it can be corrected by the generation of new manpower within the community. This tends to place the burden of immediate labour market adjustment on the international labour market.

If these propositions about highly qualified manpower are true it becomes necessary to understand the structure of the labour market for this type of manpower and the nature of its mechanism. There is a need to understand the nature of the relationship between the educational system and the economic system in order to appreciate why and how manpower is attracted into different parts of the higher educational system and to various courses of study, and to investigate the movement of highly qualified people through the labour force during a working career in order to learn why and how they select and move between occupations and occupational specialities, industries and functions. Moreover, since regional distinctions are important in the Canadian economy, there is a special need to appreciate what generates the movement of people from one part of the country to another, and at what rates it is taking place.

The research programme of the Department of Manpower and Immigration in highly qualified manpower has three main aspects: projections of future requirements and resources, studies of utilisation, and studies of the working of the labour market. However before analysis can proceed it is necessary to make observations, and to obtain more detailed information about highly qualified manpower and its economic characteristics than has hitherto been available.

1967 Survey of Scientists and Engineers.

To provide a large part of this data a major survey was specially designed and carried out in 1967. It was an extension and an improvement of a series of surveys carried out in the Department of Labour in which one-third of the population of scientists and engineers was surveyed each year. The population of the 1967 Survey is the whole of the known universe of scientists (including social scientists) and engineers. A supplementary survey in late 1967 obtained information about some additional characteristics for a sample of chemists, economists and engineers, and another supplementary survey in 1968 obtained data for chartered accountants.

The survey was a multi-purpose one, designed in consultation with the other users to meet not only the research and information needs of the Department of Manpower and Immigration but also those of the professional associations and of other Departments. It was designed to permit the simultaneous collection of comparable information from all the occupations included, rather than taking separate surveys for each profession as is the case in the United States. For this purpose a list of specialities for education and employment was used which draws heavily upon the classification system used by the National Science Foundation. A major consideration was the possibility of comparison between surveys conducted in the United States and the Canadian survey. Experience has shown that the classification system is not entirely suitable for the Canadian labour force, especially in the case of the engineers.

The instrument used for the survey ⁽¹⁾ was designed to collect data

(1) Appendix I.

about the personal characteristics of the respondent, his education at all levels and by speciality, summary information about experience, and data about employment and work functions. Employment data was collected for a period of time, a full year, in order to be able to establish the relative incidence of secondary employment and income, and for a recent point in time in order to obtain the most up to date information about principal employment.

Respondents were asked to provide their social insurance number which is being used for the purpose of sorting the file and eliminating duplication, and for linking the results of supplementary surveys. A facility is thus provided for linking the results of any future survey of the same population. An extremely small proportion of respondents objected to the request to supply the number.

The survey which is entirely voluntary, achieved a response rate of 74% of the original mailing list. The mailing list was drawn from the one which had been used for previous surveys in the Department of Labour: that list was kept manually and has been found to have included a large amount of duplication which has been eliminated in the computer processing of the 1967 survey. The relatively high rate of response was no doubt due to the efforts of the professional associations to advertise the survey to their members and to encourage them to reply. A follow-up survey of the original non-respondents yielded relatively few additional replies, and an analysis of the non-respondents suggests that most of the non-response is explained by the individuals having moved to another part of the country. The response rate for those Canadian engineers and scientists resident abroad was about 35%.

Two sets of tables are being prepared from the survey. One is based on a 10% sample which was broken into two subsequent samples in order to permit a rapid approximation of the sampling errors of the estimates being made for relatively large numbers of estimates. The second is a multi-purpose set of tables which is designed to meet most of the important needs of the various users,⁽¹⁾

(1) Appendix II.

and a capacity has been created for preparing these tables for any part of the population of the survey.

It is expected that a preliminary report outlining the main characteristics of the survey will be issued shortly to be followed by a fuller study of Canada's highly qualified manpower resources. A third phase is planned which will take the form of a series of studies of particular occupations which are to be prepared in collaboration with each profession.

Projections of highly qualified manpower.

Projections of both requirements and resources are needed not only by the Department but by all those decision-makers within the economy who are concerned with producing the future supply of highly qualified people, the demand for them in each industry and occupation, the ways in which they are employed, the regulation of professional standards, changes in the structure of a professional occupation, the choice of a career and the selection of courses of study. At present the decisions about these matters which are made by the institutions and individuals concerned are incapable of being consistent with each other because a common view is lacking about the future course which the economy and the society will follow and is capable of taking. An initial approach to providing this common background information is being made by a projection of the future manpower requirements of the whole economy in 1975 which will distinguish about 150 occupations in each of twelve industry groups in each of the five main regions of Canada. This is being made with very primitive techniques. It will be followed in due course by a computable econometric model which is being designed to take explicit account of inter-relationships within the economy. The highly qualified manpower component is initially being made at a very general level and will provide merely a framework within which further projections of a more disaggregated kind can be made. It is intended at a later stage to make a series of projections for each of the main highly qualified occupations in the fields of engineering and science.

These projections of requirements are being complemented by a projection of manpower resources which has already been developed in computable

form. A model has been built for making projections of the labour force by age, sex and level of education. The main task on this side is now to try to develop a suitable method for disaggregating by occupation in order to permit the identification of potential imbalances by occupation.

To make projections of manpower requirements and resources which are capable of being of practical use for manpower policy and planning presents a large number of formidable problems of concept and method which are well known to those engaged in research, but not to those who wish to use them. In practice projections which can be of use for manpower policy and planning need to be made with considerable detail by occupation, and in each case need to be made of requirements, resources and of the potential imbalance between them; but this need for projections with some practical utility creates two main sets of problems.

First, there is little experience of making simultaneously highly disaggregated projections, and the degree to which disaggregation can practicably be taken has to be established pragmatically. A further complication of this question is that at present there is no means of determining whether it is better to constrain projections for particular occupations within the framework of projections made for major occupation groups, or whether the latter should be modified to take account of the disparate trends which can emerge for particular occupations. Nor at present is there any basis for being able to judge whether a formal econometric model approach is capable of being developed for a particular segment such as highly qualified manpower since the nature of the independencies between highly qualified manpower and other economic variables is not understood. This approach is in the process of being designed and developed for the whole economy, but before it can be applied to highly qualified manpower in a practical way it is necessary to know more about the working of the labour market for highly qualified manpower.

The second set of problems concerns the projection of potential imbalances in the labour market. The 1967 Survey will permit projections for detailed professional occupational specialities since it will establish a data base for requirements projections and enable replacement demand to be calculated

from the age structure of the supply in 1967. This may be important because although scarcity in an occupation creates some private benefits it has private costs which arise from overwork and strain, and social costs which are a loss of output, of knowledge and probably of growth as well. There is however little experience of projecting a set of occupational imbalances. The market can be expected to act to correct some of the potential surpluses and scarcities which can be projected by movements of manpower between occupations and occupational specialities, but the incidence of these movements is not known, nor under what kinds of inducements they take place, nor even whether they occur with any regularity. For this purpose it is necessary to establish to what extent movements of highly qualified people between different ranges of occupational speciality are technically feasible, and to what extent they are capable of being induced by the market or by policy. There will be an interaction between the movements between occupations and the extent of new entry into an occupation. Finally, a knowledge of the nature of the transition between the educational system and the labour force is also an essential component of projections.

Utilisation.

Projections of future manpower requirements, even those based upon highly sophisticated techniques of analysis, do not necessarily indicate an optimal use of manpower in the future. Indeed, there is no means of determining whether a projection is towards a better degree of manpower utilisation or a work one. Manpower requirements themselves are capable of being modified by improved manpower utilisation. To some extent this can be allowed for when past trends in the use of manpower per unit of output or of service can be projected, but it is possible that if the problem is made explicit an additional improvement in utilisation can be achieved. The problem then becomes one of assessing what degree of improved utilisation is feasible and should be attempted and what kinds of policy, action, influence and discussion should be brought to bear on the problem in order to achieve a desirable result.

Ideally, projections of future requirements should not merely reflect an extrapolation of existing trends, nor a requirement generated by a specified

rate and type of economic growth, but a progressive movement towards a more efficient utilisation of manpower.

The question of utilisation itself is however a particularly intractable one. It is a concept which has so far defied clear definition. It can be conceived in a purely theoretical way as a continuum of problems ranging from, at one extreme, the broad question of allocation between occupations, functions, industries and regions to the question, at the other end of the continuum, of achieving a correspondence between the actual and potential skills of the individual and the particular requirements of the job which he performs. In principle, this may seem to be a set of problems which is capable of being approached by linear programming techniques in order to identify an optimal solution. However, a purely theoretical approach to this question which was commissioned suggests that the distributions to be examined are so detailed and the characteristics to be matched so numerous for the labour force that an easy analytical solution is not possible.⁽¹⁾ It seems evident that a much more pragmatic approach has to be found, beginning with simple observations from the 1967 Survey about the extent of measurable under-utilisation. Data will be provided about the numbers and distributions of highly qualified manpower outside the labour force, and the distribution of the work functions of those in employment. Policy and research may also have to begin in a relatively simple way by trying to ensure that there is no serious mis-matching to the extent that there are major scarcities or surpluses by occupation.

Utilisation in the textiles industry.

In the meantime however the allocation aspect of utilisation at the establishment and at the industry levels is one which requires attention. The efficient use of manpower by employers entails, among other things, securing an optimal balance between occupations within the manpower component of the overall production function. Work at a theoretical level is required in order

(1) M. Galatin: Efficiency in the Allocation and Utilisation of Manpower, Department of Manpower and Immigration, 1966.

to identify the alternative ways of defining this allocation and to establish criteria for assessing which is the best. At the establishment level and at the industry level there is a need to understand the determinants of occupational structure in order to have a rational basis for making projections of the future occupational structure of an industry. An approach to these problems is being made in a study being carried out for the Department of the utilisation of manpower in the textile industry in Quebec and Ontario. This is a study which was begun under the initial direction of Professor H. S. Parnes and has been continued in Canada. It is relatively easy to construct a hypothesis that the occupational structure of an establishment or of an industry is a function of such factors as size of establishment, rate of growth, state of technology, relative wage and salary rates and structure of output. The practical problems of conducting such a study are primarily the lack of data, and the question of distinguishing the contributions of the relevant factors. It is becoming a commonplace experience to find that many employers have poor records about their labour forces, and indeed that many have no records at all. This is particularly true of smaller establishments managed by working proprietors. The study has required the collection of a large volume of data from establishments which it has taken each of them about three to four weeks to provide. In many cases, the fact of asking for the data and the explanations which have been given for requiring it have been sufficient to make employers aware of the need to collect data and to begin to do so, but it has to be expected that it will be a very long time before employers are convinced of the usefulness of manpower research, or even of the usefulness of manpower data in efficient management. Provisional results from this study suggest a great diversity in the patterns of manpower utilisation and an extremely low level of education within the industry which may be an important factor in limiting the degree of occupational movement.

The working of the highly qualified manpower market.

Policies to meet the future imbalances identified from the projections part of the programme or to help to bring about a more efficient allocation and utilisation of manpower require a far better understanding of the working of the

labour market and of the nature of the link between it and the educational system. This third aspect of the research programme therefore becomes the most important and fundamental. The continuous processes of the creation, allocation and reallocation of highly qualified manpower entails movements between activities and places, and the study of mobility becomes one of the most practical and effective ways of examining the behaviour of the market.

Geographic mobility.

Much of the present state of knowledge about the working of the market for highly qualified manpower is based upon observations and analyses of geographic mobility which have been made possible by the availability of data about population movements. Geographic movement has been investigated in the Department of Manpower and Immigration by two studies. One of them examines geographic mobility within the educational system by a study of a cohort of scientists and engineers. ⁽¹⁾ The movements of the 1955 class of university graduates in science and engineering courses were investigated by a survey in 1964. It was a stratified sample of the full universe of male scientists and of the females in the graduating class, and 50% of the engineers, and received an 84% response. It does not give a comprehensive view of mobility within the educational system since the respondents had all graduated from high school and all possessed at least a bachelor degree.

The majority of the respondents took their bachelor degree in the province in which they had graduated from secondary school, but the mobility of those who entered post-graduate training was considerably higher: 49% of the scientists and 52% of the engineers moved to another province or to another country. Of those taking post-graduate training 27% of the scientists and 43% of the engineers obtained their degree in another country, mainly the United States.

It is possible that some of this movement may have been more apparent than real at the time that this cohort was obtaining its education. It was often

(1) D. Dyck: The Geographic Mobility of the 1955 Class of Graduates in Science and Engineering, Department of Manpower and Immigration, 1967.

the case that a student lived nearer to a university in a neighbouring province. Much of the real movement is to be explained by students searching for a university with a course suited to their particular needs. In the case of post-graduate study abroad students were attracted by a variety of institutional reasons as well as personal considerations. In a survey conducted by the Department of Labour in 1963 a sample of post-graduate students indicated that financial and academic reasons were the main ones for attracting them into the United States. These considerations may have become less strong as a result of the considerable expansion in recent years of the Canadian university system and the improvements in post-graduate opportunities and the availability of finance for post-graduate study and research. Another consideration was the greater readiness of American universities to give credits for work in non-university institutions in Canada.

It is not established that Canadians have gone to the United States because courses were unavailable in Canada. In a study conducted in 1963 by the Canadian Department of Labour respondents were asked to indicate the course of major field of study for each degree obtained. The results indicated that only about 5% had obtained a post-graduate degree in courses not studied by any of the post-graduates who obtained all their education in Canada. They were courses for engineers in geology, astronautics, automatic controls, aeronautics and aerodynamics, and science courses in mineralogy, nuclear physics, applied physics and experimental pathology. The hypothesis has yet to be proved that a large number of students move to universities in the United States because a course is unavailable nearer home.

Nor, if the transition from the educational system to the labour force is considered, is it established that students are strongly attracted by employment opportunities in the labour market surrounding the university in which they have graduated. In the 1955 cohort, 44% of the scientists, 36% of the engineers and 53% of the women obtained their first employment away from their home province. 39% of the graduates moved at least once after entering the labour force. This observation is associated with a general movement of population and of manpower within Canada into the provinces of Quebec and Ontario. The study of the 1955

cohort suggests a tendency for the more able graduates in science and engineering to move to the United States for both higher degree study and for employment, but the proportions doing so were nevertheless relatively small. Of the male graduates (199 scientists and 1,236 engineers) only 35 scientists and 81 engineers took post-graduate degrees in the United States. Of each of the two occupational groups obtaining higher degrees, a larger proportion received training to the doctoral level in the United States. Of these two groups the majority (65% of the scientists and 57% of the engineers) then returned to Canada upon graduation. Although a larger proportion of the most highly qualified people remained in employment in the United States, the numbers were relatively small. Those who entered employment in the United States after graduating from an American university tended to remain in the United States; in fact it was estimated that none of those taking employment in the United States after graduation returned to Canada within the 10 year period observed. On the other hand few members of class who went to the United States for post-graduate study or employment remained there. Moreover those who worked in the United States and subsequently returned to Canada spent a relatively short time in the United States. In the case of both the scientific and the engineering groups the mean length of employment abroad in any country (mainly the United States) was 1.6 years, which was long enough for the respondents to obtain useful experience but is unlikely to have been long enough for them to have made a full contribution to employers.

Generally, net migration from Canada to the United States is probably much smaller than has been thought mainly because the number of Canadian citizens returning to Canada has been under-recorded. ⁽¹⁾ Whereas it was thought that as many as seven-eighths of those moving from Canada to the United States remained in the United States it now appears that the proportion is much smaller and may be as low as a half. What is more important is that migration between the two countries has been increasing: while movement to the United States is increasing, there is a substantial movement from the United States into Canada of both returning

(1) K. V. Pankhurst: Migration between Canada and the United States, Annals of the American Academy of Political and Social Science, Volume 367, September, 1966.

Canadian citizens and American citizens coming to take employment in Canada, especially highly qualified manpower. The Association of Universities and Colleges of Canada has estimated that the ratio of university teachers returning to or entering Canada from the United States to those leaving Canada for the United States rose from 1.6 to 1 in 1957, to 2.3 to 1 in 1962. In 1962 there were twice as many returning Canadian university teachers as Canadian immigrants in the group. Grubel and Scott have observed that there are approximately as many American-born and trained economists teaching in Canada as there are Canadian-born and trained economists in teaching positions in the United States.⁽¹⁾ In the case of psychologists 20% of the labour force is non-Canadian, 11% being American. Canada has relatively fewer psychologists in relation to total population than the United States. Much of the growth of the population of psychologists in Canada has taken place since 1960 and has resulted from recruiting in the United States, notably for university teaching.⁽²⁾ 21% of psychologists in Canada with doctoral degrees are American citizens, and 27% of those with doctoral degrees received them in the United States.

These investigations of the geographic aspect of the labour market movement have some use, but need to be extended in order to determine the extent to which Canada is dependent upon other economies for its human capital formation. The 1967 Survey has been designed to yield some data about the extent to which the highly qualified manpower in each occupational group was born or received its education abroad, and to what extent one part of Canada draws upon others.

It is also important to make some attempt to value the international movements of manpower. If the movements are valued the net loss to Canada appears even smaller than if measured in numbers, and there may even be a net gain. It

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- (1) Herbert B. Grubel and A. D. Scott: The International Flow of Human Capital, American Economic Review, Volume 56, No. 2, May 1966.
- (2) M. H. Appley and Jean Rickwood: Psychology in Canada, Science Secretariat, Special Study No. 3, Ottawa, 1967.

has been estimated that there is a net gain to Canada in the values of the movements of university economists between Canada and the United States.⁽¹⁾ The total value of the apparent net loss of all manpower during the years 1952 to 1963 has been roughly estimated at \$382 million,⁽²⁾ but this estimate should be reduced to allow for the returning residents. A fresh appreciation is needed of the value of the movements taking into account the effects of the exchange of experience and increasing specialisation in the two economies.

The 1967 Survey of Highly Qualified Manpower will also provide data for studies of the incidence of the geographic movement of manpower from rural areas into urban agglomerations in order to be able to assess the capacity of the economy to provide those services such as health, welfare, education, etc. which depend upon an adequate supply of highly trained manpower.

The extension of research in mobility.

The development of an adequate appreciation of the behaviour of the labour market will to a great extent depend upon an extension of research into dimensions of mobility other than geographic, i.e. industrial, occupational and functional mobility,⁽³⁾ and the ways in which they combine. For the development of human resources and their more efficient utilisation, there is a need for observations of the incidence of these forms of mobility within the educational system and into the labour force, and of movements within the labour force, and some understanding of why they take place.

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- (1) Herbert B. Grubel and A. D. Scott: The International Migrations of Canadian Economists, mimeograph, 1967.
 - (2) L. Parai: The Immigration and Emigration of Professional and Skilled Manpower during the Post-War Period, Economic Council of Canada, Special Study No. 1.
 - (3) The 1967 Survey identifies 22 categories of work function which is defined as movement within an occupation between the performance of different tasks. Since manpower tends to be recruited for such functions as research, and administration from the performance of a specific occupation it becomes important to know to what extent this takes place, the degree to which the supply of manpower in the higher functions depends upon attracting manpower from other parts of an occupation, and the effects of this kind of movement upon supplies in the occupation itself.

Movements within the educational system and transition to the labour force.

To gain insight into the nature and reasons for movements within the educational system and the transition to the labour force a major survey of the educational and occupational choices of Canadian secondary school students is being carried out by the Department of Manpower and Immigration. A study is being made of a representative national sample of about 150,000 students and 8,000 teachers in 375 schools. It represented about 30% of Canada's secondary school students and about 8% of the publicly operated secondary schools in Canada. The study is intended to provide insight into the processes by which young peoples' educational and occupational aspirations are formed and modified. Specifically, it explores the effects of the school system on the attitudes and decisions of young people in secondary schools about the selection of types of education and training, the choice of occupations and of careers, and how educational and career aspirations are related to each other.

A full analysis of the survey is being carried out but the main observations are described in a preliminary report.⁽¹⁾ Two-thirds of the students in high school indicated an intention to complete high school, but the proportion intending to do so increased from the lower to the higher grades. Of those likely to leave before completing high school the largest proportion (a third) offered an explanation of work or income possibilities; and a quarter offered an explanation relating to school, such as poor performance or dislike of the school. The reported distribution of parents' and friends' wishes was similar to the students' intentions. Most students claimed to be in a programme of study preparatory to university and (where there was a choice) to have chosen their own programme. Nevertheless, many of them thought that their current programme was not the one for which they were best suited, and a large proportion did not know which courses would be best. About half the teachers thought that at least a quarter of the students were not in the programmes for which they were best suited. There was

(1) The Career Decisions of Canadian Youth: A Compilation of Basic Data, Volume I, by Raymond Breton and John C. McDonald, Department of Manpower and Immigration, 1967.

general agreement by the majority of the teachers, and also by a large proportion of the students, that it takes two years of high school before a student knows his abilities and interest well enough to choose a programme of study, or for a teacher to know him well enough to advise his choice.

Roughly half the students indicated an intention or a likelihood to continue their education after high school, either on a full or part-time basis. Of them, about a quarter indicated that they would not change their minds, but about half indicated that they might do so, while a quarter thought that they would do so if offered a job or if they lacked money. Conversely, of those not intending to study further after school, two-thirds said that they would change their minds if it were necessary to do so in order to improve their employment prospects.

In selecting a career professional and technical occupations were the most preferred, especially health, teaching, science and engineering, while those least preferred were law, computer programming, accounting, auditing, religion, statistics and economics. These preferences tended to change little during high school. Students' expectations of the training they would take and of the careers they would actually follow coincided closely with each other, but less closely with preferred careers. The proportion of students preferring professional and technical occupations was much greater than the proportion of those occupations in the labour force in 1961. Conversely, farming and craft occupations for boys and clerical and sales work for girls were preferred less than they were found in the 1961 labour force. Half the students thought that they were sufficiently well informed about different jobs in order to be able to choose a career. Success in an occupation was held by about a third of the students to be the best way to judge a person. A very large proportion (nine-tenths) thought that the most important purpose of a high school is to prepare a student for an occupational career.

The highly qualified manpower market.

It seems self-evident that the working of the market for highly qualified manpower is different from that for other kinds of manpower. It is

more highly specialised. It is evident that the incidence of mobility is greater and that the market for this kind of manpower is national and to a very large extent international, whereas the markets for lesser skills are geographically smaller, often being confined to local labour market areas. It is commonly thought that the inducements to which highly qualified manpower responds are different. The monetary inducements to become highly qualified are often held to be strong. Moreover, they often also incorporate the effects of a scarcity of this type of manpower. At the same time, many people are motivated by non-pecuniary considerations, notably considerations of service to the community by those in welfare occupations. Apart from this, highly qualified people are more easily equipped to recognise a wide range of personal, social, political and ethical considerations which influence their choice of an occupation, a speciality or a particular job, degree of responsibility, or part of the country.

One of the central problems in the analysis of the working of the market for highly qualified manpower is to assess the relative importance of salaries and of such other factors as the volume of job opportunities as inducements to movement. It is possible that the relative strength of these factors differs depending upon whether the movement is geographic, industrial, occupational or functional. At present there is insufficient evidence to suggest that any one factor predominates. In the case of geographic movement between Canada and the United States for example, the latest available information on relative earnings per head is for 1959 and is extremely general, although it suggests that in the professional and scientific occupations the ratio of United States to Canadian earnings in the national currencies to a large extent reflects the differences in the real value of the currencies. While an explanation of the manpower movements may be related to the absolute differences in the levels of real incomes, changes in the rates of migration between the two countries could be related to changes in relative salary structure. Much more up to date and detailed information is required before this problem can be examined.

There is however a considerable amount of evidence of relatively large changes in the structure of employment and in the volume of job opportunities. The importance of the growth of job opportunities appears to be indicated by the movement of Americans into professional and scientific occupations in Canada, despite the lower average level of salaries. This hypothesis is consistent with the tentative findings of the O.E.C.D. study on wages and labour mobility which found no conclusive relationship between wages and labour mobility and suggested that the volume of job opportunities may be a factor.⁽¹⁾ The movement of engineers from Canada to the United States which is very large in comparison with other occupations appears to be associated with a relatively small difference in earnings levels and with a much larger field of employment in the United States. Engineers in the United States form 1.3% of a much larger labour force, compared with 0.7% in Canada. Conversely, the net movement of university teachers into Canada appears to be induced by the increase in employment opportunities in Canadian universities which have been growing at a rate about two and a half times as fast as in the United States. It is also large in relation to the domestic supply of university teachers. What is interesting and important is that the growth of movements between Canada and the United States suggests the emergence of a much stronger common manpower market than has hitherto been the case, and which is probably stronger than the growth of the international market for highly qualified manpower. Movement from Europe to both the United States and Canada tends to be largely in a westward direction only. In the case of Canada and the United States, the two societies are sufficiently similar in their educational systems and in their economic and labour market institutions for there to be relatively little obstacle to the growth of the movements of highly qualified manpower between them.

While salaries may or may not be an important determinant of movement between region, industries, occupations and function, they also reflect the effects of the working of the educational and the economic systems, and it is a matter

(1) Wages and Labour Mobility, O.E.C.D., Paris, 1965.

of importance to know whether these two systems are sufficiently sensitive and quick to respond to the development of needs and opportunities for manpower. This problem is being approached by a study of the analysis of professional incomes in Canada using data from the 1967 Survey. It is designed to assess to what extent differences in professional incomes reflect, among other things, an economic return upon investment in education and the extent to which people are attracted into an occupation by the prospect of a rate of return in it in comparison with that in other occupations. While a considerable amount of work has been carried out elsewhere on this subject, much of it has been inconclusive primarily because many studies, in calculating the rate of return to education, have ascribed the whole of income as a return to education. If that is done it tends to suggest that the rate of return to education is relatively high. The study being undertaken for the Department of Manpower and Immigration attempts to analyse for a sample of people in a selected group of occupations the rates of return to a variety of factors including education, experience, ability and socio-economic status. If this study succeeds in computing positive rates of return to factors other than education, it will suggest that the private rate of return to education may have been exaggerated. This is not of course to suggest that the social rate of return to education is not high. It is however possible that many individuals over-estimate the value of a specific form of education and training considered from a purely personal economic point of view. In this study an attempt is also to be made to establish to what extent students select the field of their university study in response to the different rates of inducement which are offered to them by the market.

The basis for a forward thrust in studies of highly qualified manpower has to be a considerable improvement in the information available about Canada's resources. Research into the structure and behaviour of this part of the labour market cannot proceed without more detailed observations than have hitherto been available.

The information from the 1967 Survey is even more urgently required for decision-making by the bodies which have responsibilities concerning highly

qualified manpower and its use in the economic growth of Canada. It will provide a basis for much of the long-range planning which has to be done now about the distribution of investment in education, the encouragement and selection of immigrants, the development of policies for research and for science, and the more effective use of valuable human resources. Because of the high incidence of mobility and the long gestation period the effective functioning of the educational and the economic systems will become increasingly dependent upon assessments of the extent and nature of future requirements for highly qualified people and their availability. Given the heavy investments which are being required in the production and use of this type of manpower it will be increasingly desirable to attempt to achieve a broad balance between the growth of the output of the educational system and the rate of immigration in order to avoid undue strain on university capacity or substantial changes in the flows of immigrants.

APPENDIX I



DEPARTMENT OF MANPOWER AND IMMIGRATION

PROFESSIONAL, SCIENTIFIC
AND TECHNICAL MANPOWER SURVEY 1967Please enter your **FULL NAME** and **ADDRESS** below

CONFIDENTIAL

THE INFORMATION YOU ARE ASKED TO GIVE
WILL NOT BE RELEASED IN ANY WAY THAT
CAN BE IDENTIFIED WITH YOU.PLEASE READ
CAREFULLY ALL
INSTRUCTIONS
BEFORE ANSWERING
QUESTIONSPLEASE PRINT
CLEARLY

FIRST NAME		MIDDLE OR OTHER NAME	
MR. MRS. MISS			
LAST OR FAMILY NAME			
NO. AND STREET			
CITY OR TOWN	ZONE	PROVINCE	

Please give mailing or forwarding address through which you
can always be reached if different from the above address.

C/O			
NO. AND STREET			
CITY OR TOWN	ZONE	PROVINCE	

PERSONAL INFORMATION

1. SOCIAL INSURANCE NO.

--	--	--	--	--	--	--	--	--	--

2. SEX

1. ☐ Male2. ☐ Female3. DATE OF
BIRTH

Day _____

Month _____

Year _____

4. PROVINCE OF BIRTH (or country if not in Canada)

Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.
<input type="checkbox"/> 000	<input type="checkbox"/> 001	<input type="checkbox"/> 002	<input type="checkbox"/> 003	<input type="checkbox"/> 004	<input type="checkbox"/> 005	<input type="checkbox"/> 006	<input type="checkbox"/> 007
Alta.	B.C.	Yukon, N.W.T.	U.S.A.	U.K.	France	Other (Specify)	
<input type="checkbox"/> 008	<input type="checkbox"/> 009	<input type="checkbox"/> 010	<input type="checkbox"/> 020	<input type="checkbox"/> 100	<input type="checkbox"/> 111		

(IF BORN OUTSIDE CANADA OF CANADIAN PARENTS, CHECK HERE ☐)5. IF NOT BORN IN
CANADA, GIVE
YEAR OF PER-
MANENT ENTRY
TO CANADA

6. PROVINCE OF RESIDENCE, 1967 (or Country if not in Canada)

Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
<input type="checkbox"/> 000	<input type="checkbox"/> 001	<input type="checkbox"/> 002	<input type="checkbox"/> 003	<input type="checkbox"/> 004	<input type="checkbox"/> 005	<input type="checkbox"/> 006	<input type="checkbox"/> 007	<input type="checkbox"/> 008
B.C.	Yukon, N.W.T.	U.S.A.	U.K.	France	Other (Specify)			
<input type="checkbox"/> 009	<input type="checkbox"/> 010	<input type="checkbox"/> 020	<input type="checkbox"/> 100	<input type="checkbox"/> 111				

(IF PROVINCE OF RESIDENCE IN 1966 WAS DIFFERENT, ENTER CODE HERE)

7. IF NOT RESIDENT
IN CANADA, GIVE
YEAR OF DEPAR-
TURE FROM
CANADA8. CITIZENSHIP
2 JANUARY 1967

011	<input type="checkbox"/> Canadian
020	<input type="checkbox"/> U.S.A.
100	<input type="checkbox"/> U.K.
111	<input type="checkbox"/> France
	<input type="checkbox"/> Other (Specify)

9. IF NOT CITIZEN
OF COUNTRY IN
WHICH YOU NOW
RESIDE, CHECK
ONE:1. ☐ Landed
Immigrant2. ☐ Temporary
Status10. PROVINCE OF SECONDARY SCHOOL GRADUATION
(or country if not in Canada)

Nfld.	P.E.I.	N.S.	N.B.	Que.	Ont.	Man.	Sask.	Alta.
<input type="checkbox"/> 000	<input type="checkbox"/> 001	<input type="checkbox"/> 002	<input type="checkbox"/> 003	<input type="checkbox"/> 004	<input type="checkbox"/> 005	<input type="checkbox"/> 006	<input type="checkbox"/> 007	<input type="checkbox"/> 008
B.C.	Yukon, N.W.T.	U.S.A.	U.K.	France	Other (Specify)			
<input type="checkbox"/> 009	<input type="checkbox"/> 010	<input type="checkbox"/> 020	<input type="checkbox"/> 100	<input type="checkbox"/> 111				

11A. MARITAL
STATUS1. ☐ Single2. ☐ Married3. ☐ Separated,
Widowed,
Divorced

11B. DEPENDENTS

1. List the ages of all
dependents residing
with you

2. Circle, above, the ages
of those dependents
attending school.

EDUCATION

12. HIGHEST EARNED
UNIVERSITY DEGREE1. ☐ Bachelor's2. ☐ M.D., D.D.S., DVM3. ☐ Master's4. ☐ Ph.D5. ☐ D.Sc.6. ☐ Professional Certification/
Registration Only

13. PROFESSIONAL CERTIFICATION/REGISTRATION

(a) Do you have Professional Certification or Registration 1. ☐ Yes 2. ☐ No

(b) If yes, please indicate:

Board or Professional Assn.

Province Certified/Registered
(or Country if not Canada)Field of Training (Please enter code
number of Major Field - list A)*

Year Certified/Registered

Was this awarded by examination

1. ☐ Yes 2. ☐ No

* From the enclosed MAJOR FIELD and SPECIALTIES LIST.

EDUCATION (CONT'D)

14. UNIVERSITY EDUCATION – Please report both <i>degrees awarded</i> , and <i>degrees for which you are presently studying</i> under the appropriate categories in answering question 14, PARTS A TO E.		BACHELOR'S AND FIRST PROFESSIONAL (Incl. M.D., D.D.S. and D.V.M.)		MASTER'S		Ph. D.	D. Sc.
		FIRST DEGREE	SECOND (if any)	FIRST DEGREE	SECOND (if any)		
A. NAME OF UNIVERSITY (or college etc.)							
B. PROVINCE OF UNIVERSITY (or country if not Canada)	000 Newfoundland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	001 Prince Edward Island	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	002 Nova Scotia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	003 New Brunswick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	004 Quebec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	005 Ontario	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	006 Manitoba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	007 Saskatchewan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	008 Alberta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	009 British Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	010 Yukon, N.W.T.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	020 U.S.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	100 U.K.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
111 France		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
999 Other (Specify)							
C. COURSE OF STUDY (Please enter code number of MAJOR FIELD and SPECIALTY)	MAJOR FIELD (List A)*						
	SPECIALTY (List B)*						
D. DEGREE OR DIPLOMA EARNED (Specify title of degree or diploma e.g. B.Sc., B.Ed.)		check if Hons. <input type="checkbox"/>		check if Hons. <input type="checkbox"/>			
E. YEAR DEGREE AWARDED OR EXPECTED	AWARDED						
	EXPECTED						

SCIENTIFIC OR PROFESSIONAL EXPERIENCE

15. What scientific or professional experience (other than formal education) have you had prior to your employment in 1966.

	Greatest Experience	2nd Experience	3rd Experience	4th Experience
PLEASE ENTER CODE NUMBER OF SPECIALTY (LIST B)*				
NUMBER OF YEARS OF EXPERIENCE				

PROFESSIONAL IDENTIFICATION

16. Please specify your Professional Identification by completing the following:

Based on my total education and experience, I regard myself professionally as a(an):

PROFESSIONAL ASSOCIATION MEMBERSHIP

17. Please list all professional associations and technical societies of which you are a member (abbreviations accepted):

LABOUR FORCE STATUS

18. PRINCIPAL LABOUR FORCE STATUS DURING 1966 (Check one only)

Working for an employer	Self employed	Student
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>
Housewife	Retired	Other (Specify)
4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>

19. LABOUR FORCE STATUS AS OF JANUARY 2, 1967 (Check one only)

Working for an employer	Self employed	Student
1. <input type="checkbox"/>	2. <input type="checkbox"/>	3. <input type="checkbox"/>
Housewife	Retired	Other (Specify)
4. <input type="checkbox"/>	5. <input type="checkbox"/>	6. <input type="checkbox"/>

* From the enclosed MAJOR FIELD and SPECIALTIES LIST.

EMPLOYMENT

If you held any employment in either 1966 or 1967, please report it in the appropriate categories in answering questions 20 to 23E.

PRINCIPAL EMPLOYMENT refers to the job to which most time was devoted. Includes full-time jobs (i.e. jobs for which the usual work week was 35 hours or more). If two or more principal jobs of equal duration were held in 1966, report the more recent one.

SECONDARY EMPLOYMENT refers to additional jobs held at the same time as principal employment (or principal labour force status, if not employed). Includes part-time jobs (less than 35 hours a week) or summer vacation employment. If more than one secondary job was held, report job from which greatest income was derived.

FOR EACH RELEVANT EMPLOYMENT CATEGORY

ANSWER QUESTIONS 20 TO 22

		Principal Employment during 1966	Secondary Employment during 1966	Principal Employment as of 2 January 1967
20. PROVINCE OF EMPLOYMENT (or Country if not Canada)	000 Newfoundland	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	001 Prince Edward Island	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	002 Nova Scotia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	003 New Brunswick	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	004 Quebec	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	005 Ontario	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	006 Manitoba	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	007 Saskatchewan	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	008 Alberta	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	009 British Columbia	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	010 Yukon, N.W.T.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	020 U.S.A.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	100 U.K.	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	111 France	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	999 Other (Specify)			

21. TYPE OF EMPLOYER OR BUSINESS (Please check nature of employer's business or your business if self-employed)	INDUSTRY			
	FARM AGRICULTURAL, VETERINARY SERVICE	01	<input type="checkbox"/>	<input type="checkbox"/>
	FOREST SERVICE OR OPERATION	02	<input type="checkbox"/>	<input type="checkbox"/>
	FISHERIES OR FISHING OPERATION	03	<input type="checkbox"/>	<input type="checkbox"/>
	MINE, QUARRY, OIL WELL	04	<input type="checkbox"/>	<input type="checkbox"/>
	MANUFACTURING CONCERN (all products)	05	<input type="checkbox"/>	<input type="checkbox"/>
	CONSTRUCTION FIRM	06	<input type="checkbox"/>	<input type="checkbox"/>
	TRANSPORTATION ORGANIZATION OR SERVICE (air, water, road, rail)	07	<input type="checkbox"/>	<input type="checkbox"/>
	COMMUNICATIONS ORGANIZATION (telephone, broadcasting, post office)	08	<input type="checkbox"/>	<input type="checkbox"/>
	UTILITY (electrical, gas, water) (incl. govt. boards)	09	<input type="checkbox"/>	<input type="checkbox"/>
	TRADE OUTLET (wholesale or retail)	10	<input type="checkbox"/>	<input type="checkbox"/>
	FINANCIAL INSTITUTION (bank, credit, insurance, real estate)	11	<input type="checkbox"/>	<input type="checkbox"/>
	HEALTH OR WELFARE ORG. OR SERVICE (hosp., phys. office etc.)	12	<input type="checkbox"/>	<input type="checkbox"/>
	PROFESSIONAL SERVICE (except health, veterinary)	13	<input type="checkbox"/>	<input type="checkbox"/>
	OTHER ORG. OR SERVICE (prof. assoc., church, hotel, theatre etc.)	14	<input type="checkbox"/>	<input type="checkbox"/>
	EDUCATION			
	ELEMENTARY, SECONDARY SCHOOL (or school system)	15	<input type="checkbox"/>	<input type="checkbox"/>
	VOCATIONAL SCHOOL (except Institute of Tech.)	16	<input type="checkbox"/>	<input type="checkbox"/>
	INSTITUTE OF TECHNOLOGY	17	<input type="checkbox"/>	<input type="checkbox"/>
	UNIVERSITY, COLLEGE	18	<input type="checkbox"/>	<input type="checkbox"/>
	OTHER EDUCATIONAL ORGANIZATION (library, museum)	19	<input type="checkbox"/>	<input type="checkbox"/>
	GOVERNMENT (Public administration only)			
	ARMED FORCES	20	<input type="checkbox"/>	<input type="checkbox"/>
	FEDERAL DEPARTMENT OR AGENCY	21	<input type="checkbox"/>	<input type="checkbox"/>
	PROVINCIAL DEPARTMENT OR AGENCY	22	<input type="checkbox"/>	<input type="checkbox"/>
	LOCAL DEPARTMENT OR AGENCY	23	<input type="checkbox"/>	<input type="checkbox"/>
	FOREIGN GOVERNMENT	24	<input type="checkbox"/>	<input type="checkbox"/>

22. EMPLOYER OR BUSINESS Please give name, address and activity of your employer or your business if self-employed.	PRINCIPAL EMPLOYMENT DURING 1966	Name of Employer or Business	No. Street and City	Department or Relevant Unit	Employer's Activity
	SECONDARY EMPLOYMENT DURING 1966				
	PRINCIPAL EMPLOYMENT AS OF 2 JANUARY 1967				

EMPLOYMENT (CONT'D)

FOR EACH RELEVANT EMPLOYMENT CATEGORY
ANSWER QUESTION 23, PARTS A TO E

FOR EACH RELEVANT EMPLOYMENT CATEGORY ANSWER QUESTION 23, PARTS A TO E		Principal Employment during 1966	Secondary Employment during 1966	Principal Employment as of 2 January 1967
23. A.	TYPE OF EMPLOYMENT	<input type="checkbox"/> For an employer <input type="checkbox"/> Self-employed	<input type="checkbox"/> For an employer <input type="checkbox"/> Self-employed	<input type="checkbox"/> For an employer <input type="checkbox"/> Self-employed
B. TITLE OF POSITION (if applicable)				
C. PLEASE ENTER CODE NUMBER OF EMPLOYMENT SPECIALTY (LIST B)				
D. WORK FUNCTIONS	ADMINISTRATION, MANAGEMENT 01 (except of research)	01	01	01
	02 SUPERVISION (except of research)	02	02	02
	03 MANAGEMENT, SUPERVISION OF R & D	03	03	03
	04 RESEARCH	04	04	04
	05 DEVELOPMENT, PRODUCT OR TECHNICAL	05	05	05
	06 TEACHING, EXTENSION WORK	06	06	06
	07 CLINICAL PRACTICE	07	07	07
	08 COUNSELLING PRACTICE, CASE WORK	08	08	08
	09 INDUSTRIAL OR MANAGEMENT CONSULTING	09	09	09
	10 CONSTRUCTION, INSTALLATION, ERECTION	10	10	10
	11 DESIGN	11	11	11
	12 FIELD EXPLORATION	12	12	12
	13 PRODUCTION, OPERATION, MAINTENANCE	13	13	13
	14 TESTING, INSPECTION, QUALITY CONTROL	14	14	14
	COMPUTER SERVICE, 15 STATISTICAL PROCESSING	15	15	15
	16 STATISTICAL ANALYSIS, FORECASTING	16	16	16
	PERSONNEL TRAINING and 17 DEVELOPMENT	17	17	17
	18 EXTENSION WORK IN AGRICULTURE	18	18	18
	PUBLICITY (public relations, speeches, 19 broadcasting, journalism)	19	19	19
	20 SALES, SERVICE, MARKETING, PURCHASING	20	20	20
	21 REPORT, TECHNICAL WRITING, EDITING	21	21	21
	22 OTHER (specify)	22	22	22
E. INCOME AND DURATION OF EMPLOYMENT	(a) Annual income from principal employment in 1966. _____ (b) No. of months employed. (Include vacation, paid sick leave) _____ (c) If employed less than 12 months, give annual rate of income. _____	(a) Income from above secondary employment in 1966. _____ (b) No. of months employed at above secondary employment _____ (c) Was the above secondary employment Summer vacation only <input type="checkbox"/> full-time Summer vacation only <input type="checkbox"/> part-time Part-time during the year <input type="checkbox"/> (d) Income from all secondary employment in 1966. _____	(a) Annual rate of remuneration from principal employment as of 2 January 1967 _____	

Definitions

"Income" refers to gross income from employment. (i.e. total of salary, commissions, bonuses etc.)

"Full Time" means a usual work week of 35 hours or more.

"Part Time" means less than 35 hours a week.

* From the enclosed MAJOR FIELD and SPECIALTIES LIST.

APPENDIX II

DEPARTMENT OF MANPOWER AND IMMIGRATION
1967 SURVEY OF SCIENTISTS AND ENGINEERS

Table.

1. Survey population by address on returned questionnaire, or on mailing list.
2. Survey respondents by country of residence and labour force status.
3. Male survey respondents by country of residence and labour force status.
4. Female survey respondents by country of residence and labour force status.
5. Survey respondents employed abroad by field of principal employment and age group.
6. Survey respondents employed abroad by field of principal employment and level of education.
7. Survey respondents employed abroad by field of principal employment, birthplace, and citizenship and immigration status in the country of employment.
8. Estimates of highly qualified manpower residing in Canada by province and region of residence and labour force status.
9. Estimates of highly qualified manpower - male - residing in Canada by province and region of residence and labour force status.
10. Estimates of highly qualified manpower - female - residing in Canada by province and region of residence and labour force status.
11. Estimates of highly qualified manpower residing in Canada by labour force status and level of education.
12. Estimates of highly qualified manpower residing in Canada by field of study at highest degree and labour force status.
13. Estimates of highly qualified manpower residing in Canada by labour force status and age group.

- 13A. Estimates of highly qualified manpower residing in Canada
- females - by labour force status and age group.
- 13B. Estimates of highly qualified manpower residing in Canada
- males - by labour force status and age group.
14. Estimates of highly qualified manpower residing in Canada
by birthplace and sex.
15. Estimates of highly qualified manpower residing in Canada
by location of birth, citizenship and immigration status
in Canada.
16. Estimates of highly qualified manpower residing in Canada
by location of birth and province and region of residence.
17. Estimates of highly qualified manpower employed in Canada
by country of secondary school graduation and birthplace.
18. Estimates of highly qualified manpower employed in Canada
by location of birth and province and region of employment.
19. Estimates of highly qualified manpower employed in Canada
by province and region of employment and citizenship and
immigration status.
20. Estimates of highly qualified manpower employed in Canada
by level of education, years since bachelor graduation (or
professional certification) and region of employment.
21. Estimates of highly qualified manpower employed in Canada
by industry group and province and region of employment.
22. Estimates of highly qualified manpower employed in Canada
by work function and province and region of employment.
23. Estimates of highly qualified manpower employed in Canada
by location of secondary school graduation and province and
region of employment.
24. Estimates of highly qualified manpower employed in Canada
by location of birth, secondary school graduation, highest
degree and employment.
25. Estimates of highly qualified manpower employed in Canada
by field of principal employment, sex and marital status.
26. Estimates of highly qualified manpower employed in Canada
by field of principal employment and age group.

27. Estimates of highly qualified manpower employed in Canada by field of principal employment and location of birth.
28. Estimates of highly qualified manpower employed in Canada by field of principal employment and location of secondary school graduation.
29. Estimates of highly qualified manpower employed in Canada by field of principal employment and location of highest degree.
30. Estimates of highly qualified manpower employed in Canada by field of principal employment and level of education.
31. Estimates of highly qualified manpower employed in Canada by field of principal employment and years since first bachelor degree (or professional certification).
32. Estimates of highly qualified manpower employed in Canada by field of principal employment, level of education and years since bachelor graduation (or professional certification).
33. Estimates of highly qualified manpower employed in Canada by field of principal employment and province and region of employment.
34. Estimates of highly qualified manpower employed in Canada by industry group and field of principal employment.
- 35A. Estimates of highly qualified manpower employed in Canada by field of principal employment and work function.
- 35B. Estimates of highly qualified manpower - males - employed in Canada by field of principal employment and work function.
- 35C. Estimates of highly qualified manpower - females - employed in Canada by field of principal employment and work function.
36. Estimates of highly qualified manpower employed in Canada: mean and median annual rate of earnings by field of principal employment and employment status and total number by employment status.

37. Estimates of highly qualified manpower employed in Canada by field of principal employment and field of greatest scientific experience.
38. Estimates of highly qualified manpower employed in Canada by field of principal employment and field of study for the highest degree.
39. Estimates of highly qualified manpower employed in Canada by industry group and work function.
40. Estimates of highly qualified manpower employed in Canada by industry group and level of education.
41. Estimates of highly qualified manpower employed in Canada by industry group and years since bachelor graduation (or professional certification).
42. Estimates of highly qualified manpower employed in Canada by work function, level of education and years since bachelor graduation (or professional certification).
43. Estimates of highly qualified manpower employed in Canada by broad field of principal employment and rank of work function.
44. Estimates of highly qualified manpower employed in Canada by industry group of principal employment and of secondary employment, 1966.
45. Estimates of highly qualified manpower employed in Canada by broad field and industry group of principal and secondary employment, 1966.
46. Estimates of highly qualified manpower employed in Canada by broad field and work function of principal and secondary employment, 1966.
- 47A. Estimates of highly qualified manpower employed in Canada by field of study for the highest degree, level of education, and country of highest degree.
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63. Estimates of highly qualified manpower working for employers in Canada: mean and median annual rate of earnings from principal employment by work function, level of education and years since bachelor graduation (or professional certification).
64. Estimates of highly qualified manpower working for employers in Canada: mean and median annual rate of earnings from principal employment by province and region of employment, level of education and years since bachelor graduation (or professional certification).

